AGRICULTURAL NEWS LETTER

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This publication contains information regarding new developments of interest to agriculture based on laboratory and field investigations by the Du Pont Company. It also contains published reports of investigators at agricultural experiment stations and other institutions as related to the Company's products and other subjects of agricultural interest.

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CELLOPHANE POPULAR FOR PACKAGING CRANBERRIES

Cellophane in its first season of use in New Jersey took front rank as the preferred transparent packaging for fresh cranberries. New Jersey Farm and Garden, in an article, "Across the Nation in a Cellophane Bag," in its April, 1949, issue reported the big strides by which cellophane topped all other wrappers for fresh berries for retail marketing.

Cranberry men got interested in cellophane early in the Spring of 1948, when surveys and reports showed a large increase in the shipping and marketing of pre-packaged foods and it was learned that a large part of the buyer's dollar was being spent in self-service stores where the greatest volume of pre-packed goods reaches the housewife.

The New Jersey cranberry growers went to work right away on the project of marketing their 1948 crop in a self-service package, "Farm and Garden's" article says. Cape Cod and Wisconsin growers gave the Jersey men pointers that helped. Weighing machines and sealers were in use in many cranberry packers' plants in time for the September harvest.

As a result, 59 percent more cranberries were sold on the fresh fruit market during the 1948 marketing season than during the 1947 season, according to the article, and "pre-packaging was a big factor."

"Where early shipments totaled only 56 percent cellophane packed," says Farm & Garden, "this figure increased as the season progressed to 78 percent of all fresh berry shipments."

Moisture Equalized Inside and Out

Growers Cranberry Company, oldest New Jersey farm cooperative and the sales company for the American Cranberry Exchange, shipped 86 percent of all the New Jersey cranberries sold on the fresh fruit market during 1948, and 68 percent of the company's shipments for that season were made in cellophane.

Prepackaged berries were bagged in standard cellophane film, tough, transparent and sealable by heat. The composition of this film permits equalization of moisture inside the bag with that outside. Cranberries, says "Farm and Garden", are "living organisms and continue to respire after being packed." Breather holes are therefore made in the cellophane bags and in the cartons in which these are packed.

Some advertising was printed on the bags, as well as two recipes for using the berries. But printing was kept at a minimum so the fruit could be seen to advantage and could sell itself.

The cellophane-packed shipments went from New Jersey throughout the Northwest as far as Spokane, Wash., throughout the Southwest as far as Phoenix, Ariz., and along the Eastern Seaboard from Miami, Fla., to New York City.

UNITED STATES AGRICULTURAL PRODUCTION REACHES NEW HEIGHTS DESPITE FARM POPULATION DECLINE

American farmers during 1949 established new highs in the per capita production of food and fiber.

Bumper harvests of corn, wheat, cotton and other agricultural commodities were brought in, although the farm population was 2.8% lower than it was 10 years ago.

Figures have just been released on the shifting trends of the farm population, which, when correlated with statistics on agricultural production, show the great advances in production per person on the farm which have occurred in this country during the past decade. Between the lines, they speak eloquently of the role which improved skills, more use of farm machinery, fertilizers, insecticides, fungicides, weed killers, and other factors, have played in maintaining an upward curve of agricultural production in the face of a steady migration away from the farms.

In 1940 there were 30,269,000 persons living on farms in the United States. In 1949 there were 27,776,000. These are official figures of the Bureau of Agricultural Economics of the United States Department of Agriculture.

Production Increases in Ten Years

How does 1949 production compare with 1940? It went just the opposite from the population trend.

In 1940, corn production was 2,462,320,000 bushels. The 1949 crop is estimated at 3,538,000,000 bushels.

Ten years ago, wheat production was 813,305,000 bushels. This year's crop is estimated at 1,132,000,000 bushels.

The 1940 cotton crop was 12,566,000 bales. This year's crop is estimated at 14,805,000 bales.

The new figures on movement to and from the farms in the past 10 years, just issued by the United States Department of Agriculture, show that although there is a constant migration to and from the farms, a certain amount of overall stability has been reached. The huge movement away from the farms to the armed services ended in 1944, and the big migration from the services back to the farms of 1945-1948 has also been completed. The total farm population of the last three years has actually changed very little. From 27,550,000 in 1947, it dropped slightly to 27,440,000 in 1948, and rose a little to 27,776,000 in 1949. This small increase was caused principally by the increase in the birth rate and the decrease in the death rate.

Farmers Only 19% of Total Population

During 1948, the rate of increase in the farm population was 1.2%, slightly under the 1.7% increase that occurred in the total population of the United States. In 1949 the farm population made up 19% of the civilian population of the United States. This percentage has remained nearly constant in the last few years, although it is significantly less than the prewar proportion of 23% in 1940.

Births to farm residents exceeded deaths by nearly a half million in 1948. In both the farm and nonfarm populations, birth rates were high in 1948 and only slightly under those of the record year of 1947. The rise in the birthrate following the demobilization of millions of men from the armed forces after the end of World War II reached a peak in 1947, but the 1948 rates were still far above those of the 1930 decade.

The net loss through migration from farms in 1948 was only 140,000. This relatively small net migration from farms conceals the fact that many more people were involved. Approximately 1,300,000 persons moved away from farms and about 1,160,000 moved to farms in 1948. Not all this movement consisted of permanent migration. It is possible that roughly half of it may have been seasonal. Also, data from the quarterly estimates of farm population issued jointly by the Bureau of the Census and the Bureau of Agricultural Economics suggest that around 250,000 youths move to farms for the active part of the agricultural season in midsummer but do not remain on farms in midwinter.

Low Point in Farm Population Was in 1945

Although the net decrease in the farm population in 10 years was 8.2%, when the war ended in 1945 the farm population was down a record 16.8% from 1940. That year the total number of people on the farms was only 25,190,000.

A picture of the vast migrations to and from the farms caused by the war can be obtained from the 10-year figures. Ten years ago 75,000 men left the farm to join the armed services. In 1941, the figure rose to 211,000. It was in 1942, the first full year after the United States entered the war, that the biggest exodus from the farm occurred: 859,000. In 1943 for the first time the records show both departures and arrivals at the farm. A total of 605,000 went from the farm to the armed services, and 100,000 returned to the farm. In 1944, 300,000 went to war and 100,000 came back. In 1945, the trend was entirely reversed: 894,000 came back, and 191,000 went in. In 1946, 706,000 returned and 159,000 went in. In 1947, 116,000 joined the armed forces and 69,000 went back to the farm. In 1948, the trend was again reversed, but the totals were relatively small: 79,000 went to the armed forces, and 59,000 returned to the farms.

The fact that American agriculture, in the face of all sorts of dislocations and with a steady decline in the number of human hands employed, has done such a great production job, is nothing less than a trubute to American adaptability. The vast crops which were harvested this year show that farming is still the No. 1 industry in the United States. It is evident that, if the age of "chemical farming" is not here already, it is not far away.

NEW TYPE NON-METALLIC SHEATHED CABLE DEVELOPED FOR ALL TYPES OF FARM BUILDINGS RESISTS MOISTURE, FUNGI

Of the 5,859,169 farms in the United States listed by the Census Bureau, it is estimated that 5,250,000 will have electric service by 1951. The job of bringing power to so many rural users has been tremendous. And it produced many problems for the engineer. For instance, manufacturers of insulated wire and cable found that some of their standard cable constructions, which had given excellent service in other locations, just wouldn't stand up in farm use. Non-metallic sheathed cable, most generally used for wiring farm buildings, is a good example. The standard construction for this cable employs a saturated braid jacket over rubber-insulated copper conductors. But, it was soon discovered that moisture due to condensation from abrupt temperature changes, ammonia-laden air, ice, fungus and rot present in barns, stables, milk houses, hatcheries and other utility structures quickly attacked this cable and shortened its useful life considerably.

So cable engineers set about to design and produce a new type of cable which would resist all these destructive factors. In addition, they had to consider the fact that the cable would be subjected to severe mechanical abuses. It is usually installed by stapling it directly to studs or to walls or ceilings. So it must be rugged enough to take repeated hammer blows and the cutting action of staples if they are "driven home" too far. Since it may be pulled through holes bored in joists or beams, resistance to abrasion and tearing were additional requirements. Flame-resistance was also important.

New Cable Developed

To meet all these specifications, cable engineers had to develop an entirely new type of non-metallic sheathed cable. Neoprene was considered the best material for this cable because of its known resistance to fungus attack. A new construction utilizing neoprene was proven in field installations over a two year period. Tests conducted by Underwriters' Laboratories confirmed these results. From every indication, this cable completely fulfills the need for a non-metallic sheathed construction for farm service. Neoprene serves as both insulation and jacket on the new cable. The neoprene compound is especially formulated for fire, moisture and corrosive vapor resistance. And, in addition, it resists deterioration from oil and grease, acid and mold.

Many Tests Made

While a description of all the tests performed on the cable would be too lengthy a story to go into here, the results of a few tests in which the performance of the new construction is compared with that of the standard saturated braid type are significant.

In a moisture impregnation test, where samples of both types of cable were weighed, immersed in water at 50°C. for four hours, then wiped off and reweighed, it was found that samples of the new cable gained an average of 2.10% of total weight. In contrast, the standard cable samples gained an average of 8.56% of total weight.

In an abrasion test, samples of both types of cable were mounted on a horizontal reciprocating table under steel plungers. The plungers had three smoothly-finished 90 degree "V" shaped edges which were placed at right angles to the axis of the samples during the test. The force of the plungers on the samples was set at 4.5 pounds and the table made approximately 40 cycles per minute. One complete back and forth motion was considered a cycle. A count was taken of the average number of cycles it took to expose the copper conductor of the cables. The neoprene samples withstood an average of 4790 cycles. The best standard type withstood an average of 1836 cycles; the poorest an average of 962.

The cable was also tested for flame resistance; flexibility and resistance to impact at low temperatures; tensile strength; dielectric strength; and retention of tensile strength and elongation after oxygen bomb aging for 96 hours; oven-aging at 70°C. for seven days, and after immersion in oil for eighteen hours at 121°C. On all counts, the cable equalled, and in most instances far surpassed, the performance of the standard constructions.

Independent tests for fungi resistance are particularly noteworthy. Samples of both types of cable were buried in specially prepared soils. At the end of only two months, the standard samples showed definite deterioration. But, even after six months, the samples of the new cable were still in perfect condition.

HYBRID CORN AND NATIONAL WEALTH

A graphic illustration of the amount of added wealth which the use of hybrid corn brings to the United States every year was placed before Congress recently.

Dr. L. J. Stadler, professor of field crops at the University of Missouri and a cooperator of the United States Department of Agriculture, said the following when testifying before the Military Affairs Committee of the Senate: "A conservative estimate of the increase in national corn production during the 4 years, 1942-45, due to the partial use of hybrid corn, is 1,000,000,000 bushels. The money value of this increase on the basis of farm prices per bushel is more than $2,000,000,000. It is, therefore, no exaggeration to say, speaking in terms of the over-all national economy, that the dividend on our research investment in hybrid corn, during the war years alone, was enough to pay the money cost of the development of the atomic bomb."

INSECTICIDES DURING 1949 CONTROLLED DAIRY BARN FLIES WHERE SANITATION PRACTICED, WISCONSIN REPORT STATES

Insecticides did a good job of fly control in dairy barns in 1949 where sanitation and other recommendations were followed, E. H. Fisher, extension specialist in economic entomology at the College of Agriculture of the University of Wisconsin, has reported.

In Insect Control News No. 47, Mr. Fisher pointed out that flies were more numerous than usual in Wisconsin in 1949. He contrasted this with the situation when DDT was introduced. "It is unfortunate," he said, "that DDT came into popular usage at a time when flies were not so abundant. At that time excellent control was commonly had without recommended sanitation; thus miracles have been expected even in years like 1949." The findings were made jointly with Dr. R. J. Dicke of the Wisconsin research staff.

The report said that much of the complaint about the ineffectiveness of insecticides in 1949 was due to one or more of the following reasons: (1) late use of insecticides; (2) use of insecticides not recommended; (3) improper application; and (4) lack of sanitation.

"An early spring with continued warm weather and moisture in most areas", the report said, "made 1949 an ideal fly year. Flies became numerous at a very early date, and wet barnyards afforded excellent breeding conditions for them to multiply rapidly."

Farmers Delayed Spraying Schedule

When lack of sanitation was called to the attention of some Wisconsin farmers, they replied that they had been "too busy with haying and harvesting grain to keep the barnyard clean. In one such barnyard it was estimated that up to nearly 1,000 fly maggots and 1,000 fly pupae were found per cubic foot of piled manure. Since a fly generation can be completed in about one week of hot summer weather, and the population increases several thousand percent during a single generation, we can see why flies are abundant where ideal breeding areas are so convenient for them," the report said.

"Proven recommendations" for the proper use of insecticides were commonly disregarded in Wisconsin in 1949, Mr. Fisher reported. He said that whereas it has been recommended that all cattle and other livestock be sprayed beginning in May or early June, "many farmers did not spray until late June or July. Buildings other than dairy barns should also be sprayed. These include structures such as chicken and hog houses, outdoor toilets, and similar places where flies abound."

Three Cases Studied

Three case histories cited in the report pointed up the relation between santitation and the effectiveness of insecticides. They were obtained in a region where an extensive fly control campaign had been promoted.

In the first one, the barn and cattle yard had been kept immaculately clean. The cattle had been sprayed each morning and evening with a quick knockdown spray. No methoxychlor nor DDT was used, and there were only "a few flies." In tests beginning July 28, the barn was sprayed with methoxychlor. "Very excellent fly control was observed", the report stated.

Another barn, swarming with flies, was examined. It had previously been sprayed with DDT three times during the summer. It was again sprayed with DDT. "The cattle were also sprayed with DDT. In addition, on July 26 an enormous manure pile was removed from the cattle yard, and pens inside the barn were cleaned. It was estimated that the sanitation and spraying of barn and cattle brought about at least a 95% control of flies."

The third test involved a cattle yard and barn pens which were filled with manure, "affording excellent fly breeding sites." There had been no spraying during the summer, "except occasional use of quick knockdown material at milking time." Methoxychlor was then tried on the barn and dairy herd. "Six days after spraying," said the report, "the insanitary conditions had not been corrected. Thus the fly control was an estimated 65%."

Conclusion from Wisconsin Study

Among the conclusions to be drawn from this, the Wisconsin study listed these two:

"1. Methoxychlor and DDT each did good fly control where sanitation and other recommendations were followed.

"2. Neither methoxychlor nor DDT did a good job where sanitation was not practiced."

Mr. Fisher said that up to the time of writing the report there was no evidence of flies which had built up tolerances to the recommended insecticides, and promised to report such, if any develop. He closed the report by pointing out that "the dairy barn and its surroundings should be kept clean like any other food production unit."

NEW JERSEY STATE AGRICULTURAL STATION RESEARCH COVERS WIDE, VARIED FIELDS

Two hundred samples of vegetables from 10 states were studied at the New Jersey Agricultural Experiment Station at New Brunswick, N. J., to see whether there were any chemical differences between the same plant grown in different soils. This is but one of the hundreds of items of interest discussed in SCIENCE AND THE LAND -- the 1947-48 report of the station, which is a part of Rutgers, the State University of New Jersey.

Dr. William H. Martin, director of the station, cited the vegetable test as one "which may have far-reaching consequences."

"Nutrition experts," he said, "have raised the question of the effect of soil on the food value of crops grown on that soil. For example, do carrots grown in New Jersey have the same food value as those grown in Georgia or Illinois? In an attempt to answer this question, some 200 samples of different vegetables from 10 states ranging from New York to Colorado were carefully analyzed. Considerable variation in the mineral content of the vegetables was found."

Although he grants that these tests have "merely scratched the surface," and that much more research is needed, Dr. Martin adds that they "prove that it is not safe to assume that a plant, even though it appears perfect, contains the minerals needed for good nutrition."

The vegetables in question were snapbeans, lettuce, cabbage, spinach and tomatoes. They came from Georgia, South Carolina, Virginia, Maryland, New Jersey, New York (Long Island), Ohio, Indiana, Illinois, and Colorado. Analysis of the samples showed differences in mineral composition.

The indications were, the report said, that the vegetables "from the Coastal Plain States tended to contain less ash, calcium, magnesium, copper, potassium, boron, iron, molybdenum, and cobalt" than those from the West. On the other hand, the eastern vegetables contained "more manganese and sodium than those from the states farther west."

TYPICAL QUESTIONS AND ANSWERS

Of the book's 140 pages, 116 are in the form of questions and answers. Taken at random, here are samples:

"Are any radioactive elements under study in New Jersey?

"Radioactive elements are now being used as a tool in helping to solve difficult problems in agricultural research. Very small amounts of such elements can be mixed with relatively very large quantities of the non-radioactive form of the same element and fed to plants or animals. The radioactive

element in such cases acts as a 'tracer,' since its movement into and distribution within the plant or animal body can be determined accurately with the Geiger counter, even when the amount of the element in any particular part of the tissue is too small to be detected by chemical means. Photographs, called 'radioautographs,' can be produced by exposing a photographic film or x-ray film to the radioactive tissue in the dark. These show the location of the radioactive material in the plant. Since a plant cannot distinguish between a radioactive and a non-radioactive form of the same element, the relative concentration of radioactive material is an indicator of the total amount of the same element present in the tissue. The soils department is using radioactive sodium to study the value of this element to plants, and plans are under way for the use of radioactive calcium."

"Is there any value in applying fungicides to tomatoes when late blight is not a serious problem?

"Yes. In 1947 when late blight was not serious in most tomato fields in New Jersey, results obtained from a commercial field test showed that control of late blight is not the only benefit derived from applying fungicides. A five-application spray schedule using 'Zerlate' fungicide at the first, third, and fifth applications and a fixed copper at the second and fourth applications controlled not only late blight but also anthracnose and miscellaneous fruit rots. The percentages of diseased fruits on the treated and check plots were for late blight, 1 and 12.5; for anthracnose, 9.7 and 28.7; for miscellaneous rots, 5.3 and 13.4 respectively. Only 5.5 per cent of all the fruits harvested from the treated plot were discarded as culls due to disease, whereas over 24 per cent of the fruits from the check plot were discarded. The treated plot yielded 20.5 tons per acre of marketable fruit compared with only 13.1 tons per acre from the checks. Furthermore, because of control of miscellaneous foliage diseases, the quality of the marketable fruit from the treated plots was far superior to that of the fruit from the checks."

"How long does it take to produce a new corn hybrid?

"A corn breeder starting at the very beginning with the standard open-pollinated varieties will proceed approximately as follows: 4 years of selfing to isolate inbred lines, 3 years of topcross and single-cross testing, 3 years of double-cross testing at an experiment station, 2 years in statewide tests. The 12 years of work, however, does not necessarily mean success; a weakness may show up in the later years, causing the hybrid to be rejected."

ATOMIC ENERGY WORKS FOR AGRICULTURE

By Dr. Clayton McAuliffe
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Reprinted from FARM RESEARCH
for April 1949

Editor's Note:

Dr. McAuliffe is well qualified to write on the use of atomic energy in agricultural research. Born on a farm in Chappell, Nebraska, he received his A. B. degree from Nebraska Wesleyan University; his M. S. in soil chemistry from the University of Minnesota, and his Ph. D. in soil science from Cornell.

In June, 1943, he joined the Manhattan Project, Division of War Research. For three years he was at the laboratories at Columbia University and Oak Ridge, Tenn., where he was engaged in atomic research. During most of 1947 he was at the Division of Soils, Bureau of Plant Industry, Beltsville, Maryland, working on a radiophosphorus program. While there he used the stable isotope deuterium to measure the hydroxylic surface of certain clay minerals, iron, and aluminum oxides. Returning to Cornell, he received his doctorate and went on the staff of the Department of Agronomy. Late this year he plans to join the faculty of North Carolina State College, at Raleigh, where he will be in charge of a stable isotopes program now being started. He has given the AGRICULTURAL NEWS LETTER permission to reprint the following story he told in FARM RESEARCH:

The use of radioactive isotopes as "tracers" is not a new technique. Natural isotopes were being used in Germany as early as 1913 and artificial ones were discovered in France in 1934. But until the war, the artificial isotopes which have value to the soil and plant scientist had to be produced by a cyclotron or other high-voltage devices. The high cost limited their use until the development of the uranium nuclear reactor made it possible to produce isotopes in quantity and at low cost.

Soil scientists have found radioactive isotopes of great value in determining the utilization of plant nutrients. It is possible by means of a Geiger-Muller counter to measure quantities of the element so small that they cannot be detected by other means and to distinguish between the element when added to the soil and the same element present there naturally. The

radiations from radioactive isotopes will develop photographic film and it is possible to determine the distribution of an isotope in the leaf of a plant, for example. At Ithaca radioactive phosphorus is now being used in greenhouse and field studies to evaluate various phosphate fertilizers.

Field Experiment

In the field experiment a mixture of orchard grass and ladino clover was seeded on plots treated with four different phosphate fertilizers containing radiophosphorus. Comparisons were made of broadcast and drilled applications at two rates, and data were obtained on yield, chemical composition, and phosphorus absorbed from the fertilizers.

The yields and phosphorus content of ladino clover and orchard grass were the same no matter what the source of phosphate or rate of application. The average yield of ladino clover for the first harvest was higher for the drilled than for the broadcast application of phosphates.

The amount of phosphorus uptake by ladino clover from the fertilizer was higher from superphosphate during the growing season than for the other phosphate fertilizers. During the early part of the season more fertilizer phosphorus was absorbed from calcium metaphosphate than from dicalcium or tricalcium phosphates. There was an increase in the amount of phosphorus absorbed from the four phosphate fertilizers as the broadcast applications were increased from 50 to 100 pounds of P_2O_5 per acre. With superphosphate and calcium metaphosphate, more of the fertilizer phosphorus was absorbed from the drill than from the broadcast applications.

Orchard grass and ladino clover differed in the percentage of phosphorus absorbed from the fertilizers. Ladino clover absorbed more than 20 per cent of the phosphorus from the fertilizer throughout the growing season. The absorption for orchard grass was almost as high as for ladino clover at the first cutting, but decreased rapidly with the two successive cuttings. A larger percentage of phosphorus from the fertilizer was absorbed by ladino clover from drilled applications than from broadcast applications. The reverse occurred with orchard grass.

Greenhouse Experiment

In a greenhouse experiment the utilization of phosphorus from manure was compared with superphosphate. To carry out this experiment, it was necessary to make the organic phosphorus compounds radioactive. This was accomplished by feeding some radiophosphorus to a sheep. For the first time in history, manure containing radioactive phosphorus had been produced by the animal and was ready for a new experiment to study how fast the phosphorus in manure became available to plants.

A series of treatments using manure and superphosphate alone and in combination was added to the soil.

The phosphorus additions had little effect on the yield of the rye grass grown in the greenhouse. The percentage of phosphorus in the grass increased greatly with successive cuttings, and, in general, all treatments that received the manure contained a higher percentage of phosphorus in the grass than did the treatments that received only superphosphate.

In all treatments there was a decrease with time in the percentage of phosphorus in plants from the added fertilizer, except where protein-bound organic phosphorus was involved. The phosphorus from superphosphate was a little more available than that from manure, particularly in the first cutting. However, with time, the difference between the two forms decreased and at the third cutting were approaching each other. With continued time the manure phosphorus might actually be more available than phosphorus from superphosphate.

The phosphorus in the plant derived from the added fertilizer varied from 20 to 67 per cent, depending upon the treatment.

The protein-bound phosphorus was available for plant growth with an efficiency of from 20 to 30 per cent of that from superphosphate.

However, the recovery of the applied phosphorus for the three cuttings varied with treatments from 8 to 12 per cent, except for the protein-bound phosphorus which was 2 per cent.

A Research Tool

From investigations of the type described here it may be possible to determine the best type of fertilizer to use, as well as the best method and time of application, and thus enable the farmer to obtain the most efficient utilization of fertilizers.

The radioactive isotope in the experiments described above was used as a "tracer" to determine how the ordinary fertilizer acts. It is purely a research tool and should not be confused with the claimed stimulative effect of radiations on plant growth. An extensive cooperative experiment carried on by the United States Department of Agriculture and 14 states, using uranium, radium, and other sources of radiation on 18 crops has shown no beneficial effect of such radiation upon either crop growth or quality.

NEW SOUTHERN EXPERIMENTS WITH "AMMATE" WEED KILLER SUCCESSFUL IN CLEARING UPLANDS OF UNDESIRABLE TREES

"Ammate" weed killer may be effectively and economically used to kill undesirable trees of the Southern uplands, according to a new bulletin issued by the Southern Forest Experiment Station at 1008 Federal Office Building, New Orleans 12, La. This station is a part of the Forest Service of the United States Department of Agriculture.

Fred A. Peevy is the author of the leaflet, which was issued in April, 1949, summarizing nearly five years of research with "Ammate" at the Alexandria, La., branch of the station. "Ammate" is based on ammonium sulfamate, which was a laboratory curiosity for about 60 years before Du Pont chemists, a few years ago, found an economical way to produce it in commercial quantities. It has since proved effective in killing poison ivy and other weeds, and is also being increasingly used to kill trees.

"Hundreds of thousands of acres of southern uplands are covered with blackjack oak and other low-value hardwoods that must be reduced or cleared before good timber or forage can grow," Mr. Peevy said. "Many landowners have found poisoning with 'Ammate' an effective and economic way of killing these weed trees."

Mr. Peevy said that, when properly used, "Ammate" kills trees more rapidly than girdling. He said that there are fewer sprouts after "Ammate" is used than when trees are girdled or chopped down. Another advantage of the use of "Ammate" instead of some other chemicals is that "Ammate" is nontoxic to animals and humans, Mr. Peevy said.

The experiment station's tests with "Ammate" started in October, 1944, and involved use of various quantities, at different seasons, and in different forms, "and compared with sodium arsenite, 2,4-D, Diesel fuel oil, and other poisons .... On the basis of these tests, 'Ammate' is recommended as the most effective of the chemicals studied thus far for killing blackjack oak and many other upland hardwood species. However, sodium arsenite works better than 'Ammate' on bitter pecan (water hickory) and other bottomland hardwoods."

Two Different Methods Recommended

The leaflet describes, with illustrations, the two recommended methods of putting "Ammate" to work to kill trees. The first is by placing the "Ammate" crystals in so-called cups, which are really big notches cut in the tree.

"A cup", Mr. Peevy said, "is made by making two downward axe strokes, one above the other, and prying out the chip. For best results, cups should be as near the ground as possible -- on the main roots if these show. Cups

may also be made two or three feet up the trunk, but then the tree top dies more slowly than with the low cups, and sprouting is greater."

In clearing land for pasture, or for timber stand improvement, Mr. Peevy recommends that the cup method be used, and a dose of one level tablespoonful of "Ammate" crystals be placed in each cup. He said that two cups are enough for trees that measure up to six inches in diameter at breast height. If the tree is bigger, then an additional cup should be made for every two-inch increase in diameter above six inches. This treatment is recommended for blackjack oak, sweetgum, blackgum, elm, ash, bay, willow, red oak, post oak, willow oak, persimmon, and small hickory. For large hickory, beech, and white oak, a double dose is recommended. While winter is the best time for using "Ammate" in this manner, Mr. Peevy said that it is "effective during any season."

Trees Should Stand At Least One Year

When one desires to do timber stand improvement work where moderate sprouting is permissible, "Ammate" in solution may be used in so-called frills, which are cut all the way around the tree trunk. "A frill is made by hacking through the bark completely around the tree with overlapping downward axe strokes made at easy chopping height," Mr. Peevy said. His recommended procedure for blackjack oak, red oak, post oak, and willow oak is as follows:

"Mix not less than two pounds (19.3% solution) and preferably four pounds (32.4% solution) 'Ammate' in each gallon of water. Add one tablespoonful of red dye to each five gallons of solution for coloring. Pour into freshly cut frill, saturating the frill without wasting solution." He said that this method has proved effective in winter, spring, and summer.

The Southern Forest Experiment Station found that the tree absorbs the "Ammate" solution almost immediately. Crystals begin to be absorbed within 24 to 36 hours. Since the poison works for a year or more, it is recommended that the trees be left standing at least that long.

It is interesting to note that the experiments showed it is easier and costs less per acre to kill large trees than sprouts.

Users of "Ammate" are cautioned to clean their spray guns promptly and thoroughly after each use, as it is corrosive. Care also should be taken lest "Ammate" spill or spray onto desirable plants.

As for other Southern trees which have not been tested at the New Orleans station, and trees in other regions, the bulletin recommends that "the dosage and method of application should be tested on a small area."

DIFFICULTIES KEEPING UP WITH SHIFTING INTERPRETATIONS ANTI-TRUST LAWS EXPLAINED BY DU PONT GENERAL COUNSEL

Most anti-trust actions against business are due to shifting interpretations of the law by the courts, Harold C. Haskell, general counsel of the Du Pont Company and director of its Legal Department, said in a recent speech.

"I believe that by far the largest number of anti-trust indictments and civil suits come about because business men enter upon a course of action in all good faith, only to discover that the Department of Justice and the courts view as a serious offense this year something that was accepted as industrial practice last year," he declared. The statements were made by Mr. Haskell in an address to the Rotary Club at Portland, Maine. The Du Pont Company was named in an anti-trust suit filed by the Department of Justice in Chicago in June.

Mr. Haskell confessed he did not know precisely how business men are to avoid legal actions by the government that stem less from their own conduct than from changes in legal opinion.

"There are great practical difficulties lying in the way of any solution," he said. "I mention the point because the majority of anti-trust actions cannot be attributed either to willful violations of the law by business men on the one hand, or prosecution for political advantage by the government on the other."

Decision in Aluminum Case Cited

Calling attention to the Aluminum Company case, Mr. Haskell said: "The court specifically stated that it did not matter whether or not the monopoly had been obtained by legal or illegal means, that the retention of the monopoly itself was in violation of the law.

"If this doctrine holds -- and the evidence is that it will -- then I take it that under the laws of the land you can, by perfectly legal means, obtain a certain percentage of the business in an industry and find that you are automatically in violation of those laws. There is thus applied an automatic check to growth."

Mr. Haskell said it made little difference what percentage of any business might at any time be considered legal for a company to obtain. Once the principle is established that there should be a ceiling on growth, "the percentage can be changed to whatever the government thinks it ought to be."

While the court in the Aluminum Company case, as Mr. Haskell observed, held that big business could be in violation of the law regardless of whether its operations were good or bad for the public, the speaker maintained that it remained for the people to decide this question.

New Jobs Created Through Research

Mr. Haskell then, figuratively, held up the record of the Du Pont Company for inspection on this point. Observing that from the company's research laboratories have come neoprene synthetic rubber, nylon, moisture-proof cellophane, and fast-drying lacquers for the automobile industry, Mr. Haskell said:

"Thousands of American men and women today have jobs -- and good jobs, too -- who would not have them were it not for Du Pont research and Du Pont production.

"Du Pont created opportunities for the existence of thousands of small businesses.

"It has been possible for Du Pont to do these things because Du Pont is a large and successful company that can take big risks. By long and steady growth and a policy of reinvesting part of the earnings in the business, this company has financial resources to invest in ventures far beyond the scope of small organizations."

In truth, he said, "there exists between big and small business a fundamental partnership aimed at furthering the objectives of the American economy."

All on Same Street Car

Business today, Mr. Haskell said, "exists on a much higher plane than it did a quarter of a century ago."

"I believe if you look at the current attacks on business and industry, you will be struck by the fact that in most cases the things complained of happened some years ago and not only have become exceptions in American business practice, but are condemned just as much by business as by anybody else," he observed.

"If we can promote popular realization of the fact that all of us, the public, big and little business, not to mention labor and the farmer, are riding on the same street car, all of us heading for a common objective, then I can assure you there is some mighty pretty country ahead for us," he said.

POLYCHEMICALS DEPARTMENT OF DU PONT COMPANY FORMED

An organizational change in the Du Pont Company of some interest to users of agricultural chemicals went into effect on October 1. At that time the Ammonia and Plastics Departments were merged into one unit, called the Polychemicals Department.

All product lines formerly manufactured by the two units will be continued, and for the present the new department will handle its business through already established channels. Manufacture and distribution of such products as "NuGreen" fertilizer compound and "Two-Sixty-Two" feed compound will continue as usual. These become products of the Polychemicals Department.

Dr. E. D. Ries, former general manager of the Ammonia Department, heads the consolidated unit. Dr. J. A. Almquist, who has been assistant general manager of the Plastics Department, and Dr. Robert L. Hershey, who has been assistant general manager of the Ammonia Department, have been made assistant general managers of the Polychemicals Department. Arnold E. Pitcher, general manager of the Plastics Department, reached retirement age on June 30, but, at the request of the Executive Committee, he remained active until the merger was effected.

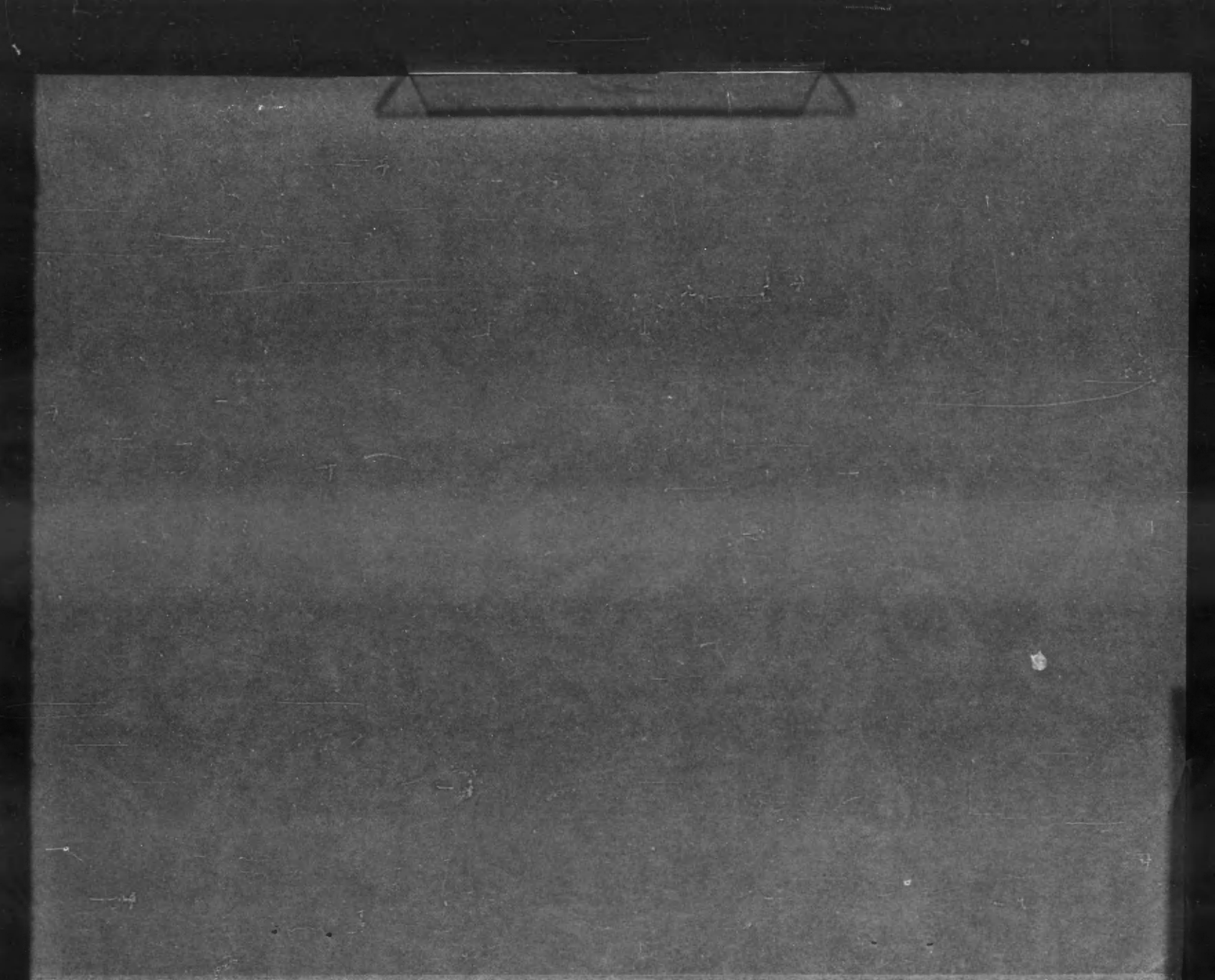
While the Du Pont Company's interest in the industrial fields served by both departments had been increasing rapidly and was expected to continue growing, the activities of the two departments had become more and more interrelated and interdependent. The change in organization conformed with the general Du Pont administrative policy of having the manufacture and sale of related products conducted under common management in the interest of better service to customers.

METHOXYCHLOR INSECTICIDE TO BE PACKED IN CANISTER

Methoxychlor, the safe new insecticide developed by the Du Pont Company, will be available in 1950 in a convenient eight-ounce container for garden and household use. Up to now the smallest quantity packed has been a four-pound bag.

Introduced in 1947, methoxychlor rapidly won recognition for its efficiency in controlling insects, its low toxicity to warm-blooded animals, and its safety to sensitive plants, such as tomatoes and cucumbers. Another advantage is that it can be used on field crops up to harvest time, as it leaves no toxic residue.

The new canister, to be marketed by the Retail Products Division of the Grasselli Chemicals Department, was designed to meet the requirements of small users. The methoxychlor in it will be of 50% strength, in the form of a wettable powder, which can be readily mixed with water. Methoxychlor technical does not mix readily with water. Besides being useful for the home gardener, the new package will be handy for mixing a spray to use on the garbage can or any spots around the yard that might serve as breeding places for flies or mosquitoes.



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